

Lehue, M. & Detrain, C. : "Consequences of an additional nest entrance on foraging dynamics in ants"

**Abstract:** *The efficient foraging strategies of ants are a core component of their ecological success. In this process, the nest entrances are considered as key-locations where workers share information about available resources discovered in the surroundings of the nest. Despite the expected role of entrances in the regulation of colony exchanges with the external environment, there is currently no quantitative research on how the number of entrance openings may impact the foraging efficiency of the colony. We examined the foraging efficiency in *Myrmica rubra* ant colonies settled in artificial nests with two different entrance configurations. First, we compared the exploitation dynamics of a 1M-sucrose source for colonies hosted in one or two-entrance nests. Regardless of the number of entrances, the total outgoing flow of workers was similar. However, as the flow was split between both entrances, this delayed the recruitment dynamics and reduced the sucrose consumption. Second, when faced with two food sources of different qualities - 1M vs 0.1M sucrose - the number of entrances altered the ability of the colony to select the best source. While the outgoing flow of workers doubled in two-entrance-nests, we noticed a weaker discrimination between the two food sources as well as a lower total sucrose consumption. An individual tracking of the foragers explained this lower foraging efficiency: a higher number of workers lost track of the trail between the nest and the food, resulting in a weaker success rate at reaching a resource. Thus, our study highlights that the structure of the physical interface between the nest and its environment is a key factor in the emergence of collective strategies in insect societies. By spatially dividing the flows of recruiters and recruits, the multiplicity of nest entrances alters the self-amplification processes that underlies collective decision making and discrimination between resources.*